Poisoning in Israel: Annual Report of the Israel Poison Information Center, 2007

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Abstract

Background: The Israel National Poison Information Center, Rambam Health Care Campus, provides telephone consultations on clinical toxicology as well as drug and teratogen information around the clock. The Center participates in research, teaching and regulatory activities and also provides laboratory services.

Objectives: To analyze data on the epidemiology of poisonings and poison exposures in Israel.

Methods: We conducted computerized queries and a descriptive analysis of the medical records database of the IPIC during 2007.

Results: Overall, 26,738 poison exposure cases were recorded, a 118.5% increase compared to 1995. Children under 6 years old were involved in 45% of cases; 73% of the calls were made by the public and 25.5% by physicians; 74.4% of exposures were unintentional and 9.2% intentional. Chemicals were involved in 37.9% of cases, pharmaceuticals in 44.2%, bites and stings in 4.3% and poisonous plants in 1.2%. Substances most frequently involved were analgesics, cleaning products and antimicrobials. Clinical severity was moderate/major in 3.5%. Substances most frequently involved in moderate/major exposures were insecticides, drugs of abuse and corrosives. Eight fatalities were recorded – three unintentional exposures (all chemicals) and five intentional (chemicals, medications, drugs of abuse).

Conclusions: The rates of poison exposures and poisonings in Israel have increased significantly, contributing substantially to morbidity and mortality. The IPIC database is a valuable national resource for collecting and monitoring cases of poison exposure and can be used as a real-time surveillance system. It is recommended that reporting to the IPIC become mandatory and that its activities be adequately supported by national resources.

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Since the beginning of the twentieth century industrialization and technological advancement have resulted in an exponential growth in the number of chemicals introduced into the environment, workplace and home. These include medications, complementary medicine products, cleaning substances, pesticides, fertilizers, petroleum distillates, intermediates in chemical processes, and drugs of abuse [1,2]. The wide availability of chemicals and medications has led to increased exposure of humans and animals to potential poisons. An unavoidable result has been an increase in the number of poisonings – a leading cause of injury-related fatalities [1,2]. Despite a continuous updating of information on poisons and poisonings, several problems have yet to be resolved: a) there is still insufficient awareness regarding the potential hazards of poisons, b) physicians have not been adequately trained in clinical toxicology, and c) keeping pace with the increasing amount of information has not always been possible due to its huge volume, limited availability and insufficient clinical exposure.

The first poison information centers were established in the 1950s worldwide in order to improve patient care (the first in Chicago in 1953) [1,2]. Their initial objective was to provide product information to health care professionals. With the same objective, the Israel Ministry of Health established the Israel Poison Information Center in Rambam Hospital in 1964. The current concept of poison centers and of the IPIC includes additional objectives such as first aid and triage advice to the community in cases of poisoning, advising health care providers (hospitals, health management organizations, emergency health services, etc.) on the rational management of the poisoned patient, avoiding unnecessary referrals to health care facilities and hospitalizations, teaching clinical toxicology to health care providers, collecting epidemiological data on incidence, severity and trends of poisoning, and providing information on how to prevent poisonings.

Like other poison centers worldwide, the IPIC provides telephone consultations on clinical toxicology to the general public and health care professionals 24 hours a day, as well as bedside consultations with the Rambam Health Care Campus in Haifa. Other types of clinical consultations provided by the IPIC include drug information and assessment of the effects of drugs, chemicals, toxins and radiation on pregnancy and lactation. An integral part of the IPIC is its clinical toxicology and pharmacology laboratory, which performs a variety of toxicological tests, therapeutic drug monitoring and occupational biomonitoring assays.

The clinical staff of the IPIC teaches clinical toxicology to health care professionals, is involved in research, updating of the commercial products database, as well as national prevention and regulatory activities. It also plays an important role in national preparedness (e.g., for multi-casualty toxicological incidents). The IPIC clinical staff comprises physicians, most of whom are board-certified in internal medicine, pediatrics and/or clinical pharmacology. The entire staff has received additional training in clinical toxicology. The physicians do daily on-duty

IPIC = Israel National Poison Information Center

and on-call shifts. This is unlike the situation in North America where first-line responders are poison information specialists (nurses or pharmacists) and the trained clinical toxicologists (physicians) are engaged in bedside medicine and serve mainly as backup [3]. Information sources used by the IPIC include various computerized databases, textbooks and journals.

Two types of computerized databases are used. The first, databases for toxicological medical records as well as for commercial products, are designated tailored databases, characterized, maintained and updated by the IPIC team. They facilitate quick searches and serve as a powerful epidemiological tool with a unique perspective as they include data collected from the general public, community medical services and hospitals. The second one, toxicological information sources, are based on poison monographs (e.g., Thomson-Micromedex Healthcare Series and Chemknowledge) and text-based search and retrieval (e.g., Toxline).

The American Association of Poison Control Centers publishes annual reports of poisonings and poison exposures [3]. This U.S. national database provides clinical information on a variety of poison exposures, encourages research and is cited in numerous articles. The only similar report from Israel was published as far back as 1981 [4]. The objective of the present study was to analyze data on the epidemiology of poisonings and poison exposures in Israel. Periodic reports of this kind are required to characterize poisonings, understand trends and stimulate research; moreover, they are essential for national decision making.

Patients and Methods

This observational study analyzes data of all calls made to the IPIC including the clinical toxicological consultations provided during 2007. The IPIC serves the entire population of Israel, which numbers 7,242,200 (2007 data). It is the only poison center in Israel that serves both the general public and health care facilities 24 hours a day. Reporting to the IPIC is not mandatory. Case records in this database (as in other national poison centers) [3,5] come from self-reported calls; they reflect information provided when the public or health care professionals report an actual or potential exposure.

The consultation process includes assessment of the patient's condition and the exposure, advice on first aid, survey of data, triage recommendation (e.g., referral to emergency department or community physician), and management recommendations (e.g., evaluation, treatment, follow-up). Since poisoning is a medical emergency, time is of the essence and the consultation should be concise and fast and at the same time comprehensive. The main point of the clinical toxicological consultation process is to provide practical knowledge, not information. Hence, the consultation is tailored to the patient, not to the substance. Quality control of the clinical consultations is achieved by daily critical and educational case conferences, establishing and updating management protocols, periodic reporting to the on-call physician during shifts, academic activities, and auditing the toxicological medical records.

All consultation data are recorded in a comprehensive structured form ("medical toxicological record") that includes caller and patient demographic details, substance/s involved, route, site and circumstances of exposure, time elapsed until consultation, clinical manifestations in a system-oriented approach, evaluation (including laboratory confirmation of exposure whenever possible), management, and follow-up recommendations. Follow-up is performed for moderate to severely poisoned patients and whenever possible. The clinical severity of each case is graded according to previously published criteria [3,6] as minor (e.g., minimally bothersome, self-limited); moderate (e.g., systemic, more pronounced and prolonged than minor manifestations but not life threatening); major (e.g., life-threatening manifestations, significant disability or disfigurement); death; unknown or not applicable. The severity grading reflects the patient's condition at the time of consultation and may not represent peak effect or later deterioration. In addition, each case is classified according to one of six main categories: chemicals, pharmaceuticals, biologicals (poisonous plants and venomous animals), miscellaneous (e.g., foreign body, batteries, radiation, thermometers, electrical injury), disease (poison exposures eventually diagnosed as unrelated disease), and "general information." Each case is then further categorized according to a previously prepared list of classifications and subclassifications available at the IPIC. All data are then entered and stored in a designated tailored database using Access 2002 (Microsoft Corporation, USA) on SQL server. All records are subjected to routine quality control.

To obtain the epidemiological characteristics of poison exposures and poisonings for the year 2007, computerized queries were performed using the various fields of the toxicological medical record. The demographic and clinical characteristics retrieved included identification of the caller and health care facility, age and gender of the patient, time elapsed between exposure and call to the IPIC, route, site and circumstances (e.g., unintentional, intentional) of exposure, agents involved, severity of poisoning, and management recommendations. Data were subjected to descriptive analysis. The method of data collection and evaluation of IPIC consultations was described previously [7-12]. Comparisons with IPIC data prior to 2007 and with the 2006 data of the American Association of Poison Control Centers [3] were made whenever possible or relevant. A waiver from ethical approval was granted by the Institutional Review Board of the Rambam Health Care Campus, Haifa.

Results

A total of 26,738 poison exposure cases were recorded at the IPIC during 2007. Table 1 shows the increase in the number of poison exposure cases reported to the IPIC in relation to the growth of the Israeli population since 1995. Table 2 depicts the various callers and sites of exposure. The percentage of calls from hospital physicians decreased by 12.9% and those of community physicians increased by 37.7% compared to 1995. (In the USA, 15.25% of calls came from health care facilities [3]). Thirty-eight calls pertained to poisoned animals, most made by veterinarians. Table 3 presents the age and gender distribution of poison victims. The time elapsed from exposure to call was

Table 1. Annual number of poison exposure cases reported to the IPIC

Year	Population served (in millions) *	Poison exposures reported	Exposures per thousand population	Exposures per thousand population, USA [3]
1995	5,619,000	12,235	2.2	9.3
1996	5,759,400	16,695	2.9	9.3
1997	5,900,000	14,792	2.5	8.8
1998	6,041,400	15,712	2.6	8.7
1999	6,209,100	15,729	2.5	8.4
2000	6,369,300	16,687	2.6	8.0
2001	6,508,800	17,035	2.6	8.1
2002	6,631,100	18,775	2.8	8.2
2003	6,748,400	19,582	2.9	8.1
2004	6,869,500	22,602	3.3	8.3
2005	6,990,700	24,605	3.5	8.2
2006	7,116,700	24,218	3.4	8.0
2007	7,242,200	26,738	3.7	Not available

* According to data of the Central Bureau of Statistics, Israel (http://www.cbs.gov.il/www/yarhon/b1_h.htm, accessed 16 March 2008)

Table 2. Site of caller and site of poison exposures

Caller *		Site of exposure	
Public **	19,427 (72.66%)	Home	19,992 (74.74%)
Physicians ***	6820 (25.51%)	Outdoors	1331 (4.98%)
Nurses	379 (1.42%)	Workplace	666 (2.49%)
Medics	54 (0.20%)	Health care facility	211 (0.79%)
Veterinarians	38 (0.14%)	School	182 (0.68%)
		Army	137 (0.51%)
		Agriculture	59 (0.22%)
		Sea	56 (0.21%)
		Industry	25 (0.09%)
		Other/unknown	4088 (15.29%)

* Institutions: hospitals 4532 (16.9%), community clinics 2367 (8.8%), emergency health services 59 (0.22%), army 86 (0.32%)

** 4247 (34.7%) in 1995 and 544 (10%) in 1981

*** 7158 (58.8%) in 1995 and 4353 (80%) in 1981

Table 3. Age and gender of poison exposure cases

Age (yrs)	Males (% of age group)	Females (% of age group)	Unknown gender (% of age group)	Total (% of total exposures)
0–5	6228 (51.69%)	4998 (41.48%)	823 (6.83%)	12,049 (45.06%)
6–12	844 (52.82%)	625 (39.11%)	129 (8.07%)	1598 (5.97%)
13–18	485 (40.28%)	641 (53.23%)	78 (6.47%)	1204 (4.50%)
Unknown child	76 (52.05%)	45 (30.82%)	25 (17.12%)	146 (0.55%)
≥ 18	3182 (35.7%)	5307 (59.54%)	423 (4.74%)	8912 (33.33%)
Unknown adult	143 (38.44%)	202 (54.3%)	27 (7.25%)	372 (1.39%)
Unknown age	303 (12.33%)	343 (13.96%)	1811 (73.7%)	2457 (9.18 %)
Total (% of total)	11,261 (42.11%)	12,161 (45.48%)	3316 (12.4%)	26,738

as follows: 13,790 (51.6%) within one hour, 1843 (5.5%) between 1 and 2 hours, 2992 (11.2%) between 2 and 8 hours, 1947 (7.3%) between 8 and 24 hours, 1016 (3.8%) more than 24 hours, and in 5150 cases (19.3%) the time was unknown or not relevant (e.g., inquiries on drug information or general information). Table 4 presents the routes of exposure, and Table 5 the circumstances of exposure. Unintentional exposures accounted for 93.5%, 91.2%, 49.7% and 58.9% of cases in age groups < 6 years, 6–12 years, 13–18 years and ≥ 18 years, respectively. Intentional exposures accounted for 0.1%, 2.6%, 43.9% and 18.9% of cases in age groups < 6 years, 6–12 years, 13–18 years and ≥ 18 years, respectively. Drug information accounted for 1.15%, 0.18%, 0.08%, and 4.65%

Table 4. Routes of poison exposures

Route *	n (%)
Ingestion/buccal	17,134 (62.75%)
Inhalation /nasal	1913 (7.00%)
Ocular	1379 (5.05%)
Dermal	1363 (4.99%)
Bite/sting	1035 (3.79%)
Parenteral	326 (1.19%)
Rectal	230 (0.84%)
Other/unknown	3921 (14.36%)

* Some patients were exposed by more than one route

Table 5. Circumstances of poison exposures

Circumstances	n (%)
Unintentional	
General *	11,454 (42.8%)
Therapeutic error **	3452 (12.9%)
Accident	1514 (5.7%)
Misuse ***	1398 (5.2)
Bite/sting	1040 (3.9%)
Food	399 (1.5%)
Occupational	302 (1.1%)
Environmental	120 (0.4%)
Other/unknown	221 (0.83)
Total unintentional	19,900 (74.4%)
Intentional ****	
Suicide	2048 (7.7%)
Abuse	304 (1.1)
Malicious	58 (0.2%)
Other/unknown	49 (0.18%)
Total intentional	2459 (9.2%)
Drug information	2004 (7.5%)
Unknown circumstances	2391 (8.9%)

* Exposures that could not be classified otherwise. Refers mainly to pediatric exposures (e.g., curiosity and experimentation by young children)

** Unintentional incorrect use of a pharmaceutical (e.g., dose, route, wrong person, medication, indication, interaction). Refers to errors made by health care providers, parents or caregivers.

*** Unintentional improper or incorrect use of a non-pharmaceutical (chemical) substance.

**** Intentional: suicide, abuse, malicious.

Table 6. Clinical severity of poison exposure cases according to age groups

Severity	< 6 years n (% of age group)	6–12 years n (% of age group)	13–18 years n (% of age group)	≥ 18 years n (% of age group)	Unknown age n (% of unknown age)	Total
No effect	8863 (73.6%)	796 (49.8%)	435 (36.1%)	2489 (27.9%)	897 (30.2%)	13,480 (50.4%)
Minor	2408 (20.0%)	643 (40.2%)	582 (48.3%)	3967 (44.5%)	648 (21.8%)	8248 (30.9%)
Moderate	72 (0.60%)	40 (2.5%)	68 (5.6%)	463 (5.2%)	95 (3.2%)	738 (2.8%)
Major	8 (0.07%)	6 (0.4%)	17 (1.4%)	130 (1.5%)	31 (1.0%)	192 (0.7%)
Death	1 (0.01%)	0 (0.0%)	1 (0.1%)	6 (0.1%)	0 (0.0%)	8 (0.0%)
Unknown	697 (5.8%)	113 (7.1%)	101 (8.4%)	1858 (20.8%)	1299 (43.7%)	4072 (15.2%)

Table 7. Clinical severity of poison exposure cases according to circumstances of exposure

Severity	Unintentional n (% of unintentional)	Intentional n (% of intentional)	Drug information n (% of drug information)	Unknown n (% of unknown)	Total n (% of total exposures)
No effect	12,033 (60.47%)	659 (26.81%)	360 (17.96%)	437 (18.37%)	13,489 (50.45%)
Minor	6554 (32.93%)	1191 (48.45%)	151 (7.53%)	358 (15.05%)	8254 (30.87%)
Moderate	331 (1.66%)	309 (12.57%)	18 (0.89%)	80 (3.36%)	738 (2.76%)
Major	60 (0.30%)	89 (3.62%)	3 (0.14%)	40 (1.68%)	192 (0.72%)
Death	3 (0.01%)	5 (0.20%)	0 (0.00%)	0 (0.00%)	8 (0.03%)
Unknown	917 (4.60%)	205 (8.34%)	1472 (73.45%)	1463 (61.52%)	4057 (15.17%)

Table 8. Agents most frequently involved in single poison exposures

Chemicals		Pharmaceuticals		Biologic agents	
Cleaning products	1610	Analgesics	2057	Plants	346
Insecticides	1065	Antimicrobials	1245	Scorpions	220
Corrosives	945	Topical preparations	874	Snake	193
Hydrocarbons	777	Vitamins & supplements	707	Scolopendra	141
Personal care products	761	Sedatives/hypnotics	512	Spiders	128
Gases	715	Cold & cough preparations	484	Aquatic creatures	113
Scale removers	678	Sympathomimetics	474	Hymenoptera	94
Bleaches	658	Hormones	421	**Miscellaneous**	
Arts & office supplies	367	Gastrointestinal	353	Food	525
Alcohols	300	Minerals	338	Thermometer	257
Adhesives	243	Antihistamines	286	Batteries	192
Essential oils	185	Antidepressants	281	Radiation	141
Rodenticides	149	Cardiovascular	281	Foreign bodies	115
Metals	82	Complementary	239	Electrical injury	19
Herbicides	77	Anticholinergics	225		

of cases in age groups < 6 years, 6–12 years, 13–18 years and ≥ 18 years, respectively.

The treatment sites recommended by the IPIC were: site of exposure 50.9% (e.g., no need for referral or observation/treatment in health care facility, no treatment required or only first-aid measures such as skin irrigation or dilution with water), emergency department 15.8% (when observation/treatment in a hospital was required), community clinics 15.2%, admission to hospital ward 3.9%, admission to intensive care unit 1.4%, not applicable 12.8% (e.g., retrospective questions, prospective drug information inquiries, general information). Table 6 demonstrates the clinical severity of poison exposures according to age groups, and Table 7 the clinical severity by circumstances of exposure.

Eight human fatalities were recorded in 2007: a 3 year old male was poisoned by carbon monoxide (accident), a 15 year old male by asphyxiant gas (abuse), an 18 year old female by cyclic antidepressants (suicide), a 26 year old male by drugs of abuse, a 30 year old male by asphyxiant gas (abuse?), a 30 year old female by organophosphates (misuse), a 42 year old female by neuroleptics (suicide), and a 66 year old male by an unknown pesticide (misuse).

The various therapies and interventions recommended by the IPIC include supportive measures, mechanical ventilation, decontamination (e.g., skin irrigation, dilution, activated charcoal, gastric lavage, whole-bowel irrigation, ipecac syrup), enhanced elimination (e.g., multiple dose activated charcoal, hemodialysis/hemoperfusion, urine alkalinization), hyperbaric chamber, gastroscopy, local treatment and drugs and antidotes

Table 9. Substances most frequently involved in single poison exposures with moderate/major clinical severity*

Substance	n	Most frequent agent	N
Insecticides	91	Organophosphates	58
Drugs of abuse	89	Opioids	20
Corrosives	62	Alkali	38
Alcohols	62	Ethanol	56
Snake	42	*Vipera palaestinae*	32
Gases	39	Irritant gases	14
Anticonvulsants	37	Carbamazepine	14
Analgesics	30	Acetaminophen	13
Hydrocarbons	22	Petroleum distillates	7
		Organic solvents	7
Neuroleptics	14	Atypical neuroleptics	7
Antidepressants	13	Lithium	5
Scorpions	13	*Leiurus quinquestriatus*	13
Cardiovascular drugs	12	Digoxin	8
Plants	12	Mushrooms	3
Herbicides	8	Paraquat	6

* Exposure to multiple pharmaceuticals occurred in an additional 158 moderate/major cases

Table 10. Summary of poison exposure cases by IPIC categories, classifications and subclassification

Table 10A: Chemicals

Adhesives	
Contact glue	52
Cyanoacrylate	101
White glue	28
Other/unknown	63
Alcohols	
Ethanol	265
Ethylene glycol	9
Glycols, other	2
Isopropanol	5
Methanol	3
Other/unknown	16
Aldehydes	
Formaldehyde	20
Other/unknown	7
Arts & office supplies	
Correction fluid	48
Crayons	21
Ink	172
Plasticine	17
Other/unknown	110
Asbestos	7
Bleaches (e.g., hypochlorite)	657
Cleaning products	
Deodorizers	116
Detergents	1220
Waxes	6
Other/unknown	275
Corrosives	
Acid	226
Alkali	498
Hydrofluoric acid	10
Phenol	6
Other/unknown	162
Cyanide	1
Essential oils	186
Fertilizers & growth regulators	34
Fungicides	12
Gases	
Asphyxiants	93
Carbon monoxide	396
Freons	8
Hydrogen sulfide	13
Smoke	106
Other/unknown	37
Herbicides	
Carbamates	3
Glyphosate	31
Paraquat	14
Urea-based	2
Other/unknown	27
Hydrocarbons	
Halogenated hydrocarbons	19
Paints, solvent-based	68
Petroleum distillates	355
Solvents	287
Other/unknown	43
Insecticides	
Carbamates	75
Methyl bromide	13
Mixed insecticides	162
Organochlorines	2
Organophosphates	350
Pyrethrins	218
Other/unknown	238
Metals	
Lead	40
Mercury	11
Metal fume fever	2
Other/unknown	25
Miscellaneous	
Aquarium products	35
Cigarettes	35
Fire extinguishers	45
Insect repellent	145
Paints, water-based	72
Other (e.g., silica gel)/unknown	1410
Multiple chemicals	204
Personal care products	
Cosmetics	54
Perfumes and colognes	96
Soaps	178
Other/unknown	434
Pesticides, other	
Alpha chloralose	2
Strychnine	1
Other/unknown	10
Rodenticides	
Anticoagulants	98
Fluoroacetamide	9
Phosphides	14
Other/unknown	26
Scale removers	672
Unknown	142
Total chemicals 10,747 (37.9%)	

chemicals (37.9%), pharmaceuticals (44.2%), bites and stings (4.3%), poisonous plants (1.2%), and miscellaneous (e.g., batteries, electrical injury, foreign bodies, drowning – 4.9%). Poison exposures diagnosed as unrelated medical illness accounted for 3.8% of the cases and general information inquiries for 3.7%.

Table 8 shows the agents most frequently involved in single poison exposures. In children under 6 years old the most frequent poison exposures were to cleaning products (n=1237), analgesics (n=1132), antimicrobials (n=677), vitamins and supplements (n=594), and personal care products (n=561).

Table 9 shows the agents most frequently involved in exposures with moderate to major clinical severity. In children under the age of 6 the most frequent exposures with moderate/major severity were to insecticides (n=9), corrosives (n=8), gases (n=8), neuroleptics (n=4), anticonvulsants (n=3) and sympathomimetics (n=3). Table 10 presents a summary of poison exposure cases by IPIC categories, classifications and subclassifications. More detailed data are available but were not presented due to space limitations.

Discussion

The IPIC is the national poison center of Israel and the only one providing 24 hour consultations for both the health care system and the general public.

Our data show an increase of 118.5% in poison exposure cases reported to the IPIC in the past 12 years and an increase of 68.2% in penetrance (poison exposures per 1000 population). Almost 73% of calls to the IPIC were made by the public, unlike the situation in the past – 34.7% and 10% in 1995 and 1981 respectively. Although the current data are similar to the U.S. report, the penetrance per population is 3.7, i.e., 2.2 lower than in the USA [3]. This trend of increased calls from the public should be encouraged since many poison exposures (mainly pediatric and in the home) are asymptomatic or mild and can be managed at home with follow-up by the poison center, as needed. Thus, rational triage by poison centers can prevent unnecessary referrals to health care facilities, prevent unnecessary evaluations and treatments, reassure victim and family and reduce health expenditures [13-18].

A decrease of 4.7% in physicians' calls was observed over the last 12 years. Hospital calls decreased by 12.9% while calls from community physicians increased by 53.4%. These trends can be

(e.g., anti-tetanus, β_2 agonists, N-acetylcysteine, antihistamines, corticosteroids, atropine, obidoxime, naloxone, flumazenil, H_2 antagonists, ethanol, fomepizole, anti-venoms, glucagon, benzodiazepines, anti-parkinsonians, calcium gluconate, digoxin Fab-fragments antibodies, methylene blue, sodium thiosulfate and hydoxocobalamin).

Several trends of decreasing recommendations for gastrointestinal decontamination were observed between 1997 and 2007: induction of emesis by syrup of ipecac decreased from 55 to 5 cases, activated charcoal from 1069 to 205 cases (possibly because it had been given prior to consulting the IPIC), and gastric lavage from 477 to 108 cases. Recommendations for whole-bowel irrigation increased from two to five cases.

The distribution of categories of exposures was as follows:

Table 10B: Pharmaceuticals

Analgesics		**Cardiovascular**		**Minerals**	
Acetaminophen	869	Alpha-blockers	9	Calcium	16
Aspirin	55	ACE inhibitors & ARBs	61	Fluoride	7
Dipyrone	74	Anti-arrhythmics	9	Iron	277
Mixed analgesics	74	Beta-blockers	100	Potassium	3
NSAIDs	831	Ca channel blockers	52	Other/unknown	28
Opioids	57	Digoxin	15	**Miscellaneous**	
Other/unknown	47	Nitrates	3	Anti-leukotrienes	97
Anesthetics		Other/unknown	33	Anti-migraine	21
General	18	**Cold & cough preparations**	486	Anti-parkinson	22
Local	37	**Complementary medicine**		Colchicine	8
Anti-cholinergics		Botanicals	76	Cromoglycate	4
Atropine	194	Dietary supplements	29	Hypolipidemic	64
Other/unknown	33	Homeopathic	65	Mouthwash	33
Anticoagulants		Mixed preparations	22	Mucolytics	51
Heparin	5	Other/unknown	51	Oral hypoglycemics	24
Warfarin	27	**Contrast media**	32	Other/unknown	215
Other/unknown	15	**Corticosteroids**		**Multiple pharmaceuticals**	1555
Anticonvulsants		Inhaled	40	**Neuroleptics**	
Bartiturates	15	Systemic	70	Butyrophenones	15
Carbamazepine	79	Topical	41	Phenothiazines	44
Phenytoin	14	**Diuretics**		Thiobenzodiazepines	9
Valproic acid	55	Furosemide	3	Thioxanthenes	8
Other/unknown	54	Thiazides	11	Other (atypical)/ unknown	87
Antidepressants		Other/unknown	4	**Sedatives/hypnotics**	
Cyclic	20	**Drugs of abuse**		Benzodiazepines	420
Lithium	25	Cannabinoids	26	Other/unknown	75
MAO inhibitors	2	Cocaine	19	**Sympathomimetics**	
SSRI & SNRI	190	Hallucinogenic amphetamines	14	Dietary amphetamines	2
Other/unknown	46	LSD	2	Methylphenidate	122
Antihistamines		Opioids	34	Nasal drops	4
Astemizole/ terfenadine	3	Other/unknown	172	Theophylline	6
Fexofenadine	7	**Eye/ear/nose throat preparations**	434	β2 agonists	312
Loratadine	32	**Gastrointestinal drugs**		Other/unknown	24
Other (e.g., chlorpheniramine, promethazine)/unknown	243	Antacids	59	**Topical preparations**	
Antimicrobials		Antidiarrheal	30	Analgesics	47
Aminoglycosides	3	Anti-emetics	50	Antimicrobials	161
Antifungal	55	Antispasmodic	23	Disinfectants	201
Antiparasitic	77	H2 antagonists	22	Mixed preparations	83
Antituberculosis	6	Laxatives	43	Pediculocides	88
Antiviral	36	Proton pump inhibitors	52	Other/unknown	295
Cephalosporins	134	Other/unknown	67	**Vaccines**	56
Macrolides	125	**Hormones**		**Veterinary drugs**	57
Penicillins	689	Eltroxin	95	**Vitamins and supplements**	
Quinolones	23	Insulin	6	Multivitamins	112
Sulfonamides	18	Oral contraceptives	226	Vitamin A+D	284
Tetracyclines	18	Other/unknown	14	Other/unknown	291
Other/unknown	70	**Immunosuppressants**	6	**Unknown**	128
Antineoplastic	26			**Total pharmaceuticals**	**12,548 (44.2%)**

NSAID = non-steroidal anti-inflammatory drug, ACE = angiotensin-converting enzyme, ARB = angiontenin receptor blocker, MAO = monoamine oxidase, SSRI = selective serotonin reuptake inhibitor, SNRI = selective norepinephrine reuptake inhibitor.

explained by the "fee for service" system which discourages physicians to consult the IPIC (as indicated by physicians calling the IPIC), as well as improved patient care provided by emergency medicine physicians and increased utilization of community-based medical services. It should be emphasized that the toxicological consultation provided by the IPIC has never been withheld or delayed because of payment issues.

It is known that poison centers contribute markedly to the rational care of the poisoned patient and save on health care costs [13-18]. Therefore, it is of utmost importance that the Ministry of Health fully cover all expenses of the IPIC (e.g., tenures, operational budget), and enable canceling the fee-for-service system. This will encourage physicians to consult with experts in clinical toxicology and improve the care of the acutely poisoned patient.

The three groups of substances most frequently involved in all poison exposures were analgesics, cleaning products and antimicrobials. The three groups of substances most frequently involved in moderate to major exposures were insecticides, drugs of abuse and corrosives. About 56% of poison exposures were in children, 45% in children under the age of 6. The severity of exposures in this young age group is less than in adolescents and adults, probably due to limited exposures (e.g., usually to one substance, small dose) and early recognition as opposed to exposures to multiple agents and deliberate self-poisonings in older patients [7]. The most common exposures in children under 6 years old were to cleaning products, analgesics and antimicrobials. Insecticides, corrosives and gases were mostly involved in moderate to major cases. The rate of deliberate self-poisonings (e.g., suicide attempts), the distribution of severity and the management of cases are similar to the U.S. data, as is the trend to recommend fewer gastrointestinal decontamination procedures [3].

Limitations of the study

The IPIC data rely on self-reporting and reflect only information provided by the caller so that some exposures may go unreported. Therefore the data may not

Table 10C: Biologic agents

Bites & stings		**Snakes**		**Plants**	
Animal bites	93	*Echis coloratus*	7	Mushrooms	49
Insect stings	65	*Vipera palaestinae*	124	Anti-cholinergic (e.g., datura)	16
Aquatic creatures		Other/unknown	41	Digitalis-like (e.g., oleander)	22
Fish	74	**Spiders**		Irritants (e.g., arum)	88
Jellyfish	22	Latrodectus	6	Palm	22
Sea urchin	4	Loxosceles	40	Other/unknown	142
Other/unknown	12	Other/unknown	83	**Unknown bite/sting**	147
Hymenoptera					
Bees	42				
Wasps	24				
Other/unknown	3				
Scolopendra	142			**Total biologic agents 1543 (5.4%)**	
Scorpions	221				

Table 10D: Miscellaneous agents

Batteries	192
Drowning	2
Electrical injury	19
Food, contaminated/ poisoning	497
Foreign bodies	115
Radiation	143
Thermometers	256
Other/unknown	185
Total miscellaneous 1409 (4.9%)	

Table 10E: Disease and general information

Disease	1075 (3.8%)
General information	1047 (3.7%)

Numbers refer to exposures to a single agent. Actual number of exposures in each category classification or subclassification might be higher because of additional multiple exposures

directly identify the overall incidence and trend of poisonings in Israel. It should be noted that aside from the IPIC there is no other national registry of poisonings in Israel. The method of operation of the IPIC limits its ability to verify the accuracy of every report. The grading of severity reflects the patient's condition at the time of consultation rather than the peak effect, thus possibly underestimating to some extent the true severity. These limitations are common to other national poison centers, including those in the USA [3].

Conclusions

The number of poison exposures reported to the IPIC has grown continuously and dramatically since its inception in 1964. Poisonings continue to be a significant health problem. The IPIC provides specific and expert means to rationalize treatment and improve the care of the poisoned patient. The IPIC database represents a valuable national resource to collect and monitor poisoning exposures in Israel. These data are utilized to identify hazards early, focus on prevention education, guide and stimulate clinical research, direct training, assist in preparedness and detect chemical/bioterrorism incidents. IPIC data should be used to support regulatory actions (e.g., prompt product reformulations, repackaging, recalls and bans), contribute to post-marketing surveillance and monitor the implications of marketing of over-the-counter medications, especially those intended for general sale not in pharmacies

In order to reach all these targets, it is recommended that reporting to the IPIC become mandatory, the fee-for-service system be cancelled and the IPIC be adequately supported. The latter can be achieved by increasing funding from the Ministry of Health with the participation of health care facilities, pharmaceutical and consumer product companies, and possibly also of the general public.

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The soul is healed by being with children

Fyodor Dostoyevsky (1821-1881), Russian novelist, whose works include *Crime and Punishment* and *The Brothers Karamazov.* Dostoevsky's literary output explores human psychology in the troubled political, social and spiritual context of 19th-century Russian society. Considered by many as a founder or precursor of 20th century existentialism